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I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2005900832 for a patent by SAMUEL PATRICK COSTIN as filed on 23 February 2005.

I further certify that the name of the applicant has been amended to MODALCO PTY LTD pursuant to the provisions of Section 104 of the Patents Act 1990.

WITNESS my hand this
Fifth day of May 2005

LEANNE MYNOTT
<u>MANAGER EXAMINATION SUPPORT AND SALES</u>

2005900832 23 Feb 2005

This invention relates to improvements in retaining wall design and construction.

Retaining walls usually consist of a masonry block face at a vertical or near vertical position with soil behind the face. Many sites contain soils such as clays which have a very slow rate of permeation of water. As a result the soils become saturated during rains resulting in storage of water behind the wall. This storage causes hydrostatic pressure to increase thereby pushing the wall away from the soil.

The usual design of a retaining wall in such soils of low permittivity is to place a high permittivity material behind the wall for the majority of its height to prevent storage of water behind the wall. Such material usually consists of stone particles of sufficiently large and common size to cause voids to exist between them. These voids permit the egress of fluid such as rain water to the base of the wall where it exits the wall usually through drainage pipes.

Such walls are usually constructed by building the masonry block wall layer by layer and backfill and compact soil behind the wall, usually in single layer heights. During backfilling it is usual to deposit high permittivity material directly behind the wall to a thickness adequate to permit sufficient drainage and place and compact the low permittivity material behind it. In reinforced earth walls the reinforcement strips or mat are placed over the blocks and backfill and the process repeated layer by layer until a wall of sufficient height is obtained.

After the blocks and backfill materials have been placed the large common size particles of the high permittivity material are easily dislodged by workmen as they travel over the material and also by the action of placing the soil reinforcement mesh or strips. As a result the stones are kicked onto the previously laid row of blocks under the soil reinforcement thereby preventing the installation of the next row of blocks. In a separate action the installer must clear the stones before block laying can continue. In addition, the amount of high permittivity material placed behind the wall is excessive because the loose material will not support itself. This high permittivity material is usually very expensive resulting in increased materials and installation costs.

These problems have been overcome by the present invention by incorporating drainage holes in the back of the wall where the wall consists of hollow blocks. It is usual practise to fill the cavities of hollow blocks with high permittivity material and provide a thick layer of high permittivity material on the other side of the rear block wall. This invention incorporates holes into the back wall of the block thereby permitting sufficient egress of fluid from the low permittivity material behind the wall to the high permittivity material in the block cavity. The design of the blocks that constitute the wall create continuous vertical channels of high permittivity material to the base of the wall where similar holes in the front of the wall permit the fluid to escape.

In one form the invention consists of a plurality of hollow masonry units said units consisting of one or more cavities continuous through its vertical profile and a hole in one of its walls protruding continuously from the internal cavity to the exterior of the masonry unit which are laid on top of each other to form a wall consisting of an exterior face with holes at the bottom and a soil side wall where a plurality of holes exist of sufficient cross section to permit the escape of fluid thereby preventing increase in hydrostatic pressure against the soil side of the wall.

In another form the invention consists of a plurality of hollow masonry units said units consisting of one or more cavities continuous through its vertical profile and a slot or plurality of slots in one of its ends protruding continuously from the internal cavity to the exterior of the masonry unit which are laid on top of each other to form a wall consisting of an exterior face with holes at the bottom and a soil side wall where a plurality of holes exist of sufficient cross section to permit the escape of fluid thereby preventing increase in hydrostatic pressure against the soil side of the wall.

In another form the invention consists of a plurality of hollow masonry units said units consisting of one or more cavities continuous through its vertical profile and a slot or plurality of slots in both of its ends protruding continuously from the internal cavity to the exterior of the masonry unit which are laid on top of each other to form a wall consisting of an exterior face with holes at the bottom and a soil side wall where a plurality of holes exist of sufficient cross section to permit the escape of fluid thereby preventing increase in hydrostatic pressure against the soil side of the wall.

To assist with understanding the invention reference will now be made to one embodiment of one form of the invention on the accompanying drawings:

Figure 1 is an isometric view of a typical hollow masonry unit (1) consisting of two cavities (2) and two slots

formed into one side of the block (3).

Figure 2 is an isometric view of the bottom layer of blocks. This shows a row of blocks (1) laid side by side with the cavities (2) full of high permittivity material and the slots (3) located at the front of the face. This layer is typically buried into the soil on both sides.

Figure 3 is an isometric view of the connection of the bottom layer with the second bottom layer of blocks. It shows the two layers (1) from the face side of the wall with the slots (3) of the lower layer at the front of the wall and the slots (not seen) of the upper layer at the rear lower edge of the blocks. The bottom layer of blocks are shown full of material and the upper layer is shown empty.

Figure 4 is an isometric view of an assembled retaining wall prior to backfilling. The blocks (1) of the layers above the bottom layer are laid so that the slots (3) are all at the lower rear edge. Typically the reinforcing strips (4) that maintain wall stability are inserted through these slots (3) at every second layer. The top layer of blocks are solid to prevent rain water from directly entering the wall cavity.

The wall face constructed by stacking the blocks as shown in figure 4. The dimensions of these slots (3) are such that the maximum predicted rainfall for the geographical location will drain from the soil at a rate faster than the flow capacity of the natural soil behind. The first layer of blocks (1) are laid on the compacted foundation soil with the slots (3) facing to the front (face side) of the wall and the cavities (2) of the blocks (1) filled with an aggregate of particles commonly 10mm to 14mm size to provide high permittivity. Any soil reinforcement strips (4) are inserted through the blocks as they are placed at the wall.

As most retaining walls have approximately one block laid beneath the ground the next layer of blocks (2nd layer) are laid with the slots on the rear (soil side) of the retaining wall. This will permit the water travelling inside the cavities to exit outside the retaining wall. Because the slots are at the base of the wall they will not detract from the appearance of the finished wall. The accumulated fluid inside the vertical channels will create a pressure head that increases the flow through the bottom slots in the face of the wall. The high permittivity material and soil reinforcing strips are also installed as before.

The other layers of blocks are installed with the slots at the rear (soil side) of the retaining wall. The result is a wall consisting of continuous vertical channels of high permittivity material. These channels act as conduits for the rain water that flows into them from the many continuous slots in the back of the wall. The water flows out of the conduits through the slots in the face of the wall at the base of the wall.

It will be realised that the improvements to the retaining wall according to this invention is not restricted to the amount and dimensions of slots in the blocks that will change depending on the predicted inflow of fluid. Also, the shape of the slot may be altered to suit manufacturing processes or cavity fill particle sizes. Any person skilled in the art of retaining wall design or construction will realise the soil reinforcement will protrude through the slots in the blocks permitting easier installation. That person will also realise that some retaining walls are cement mortared for aesthetic purposes in which case cement mortar must not be placed in the slots.

All such modifications and variations together with others that will be obvious to a person skilled in the art are deemed to be witness to this present invention the nature of which is duplicated from the above description.

SAMUEL PATRICK COSTIN FEBRUARY 23rd 2005

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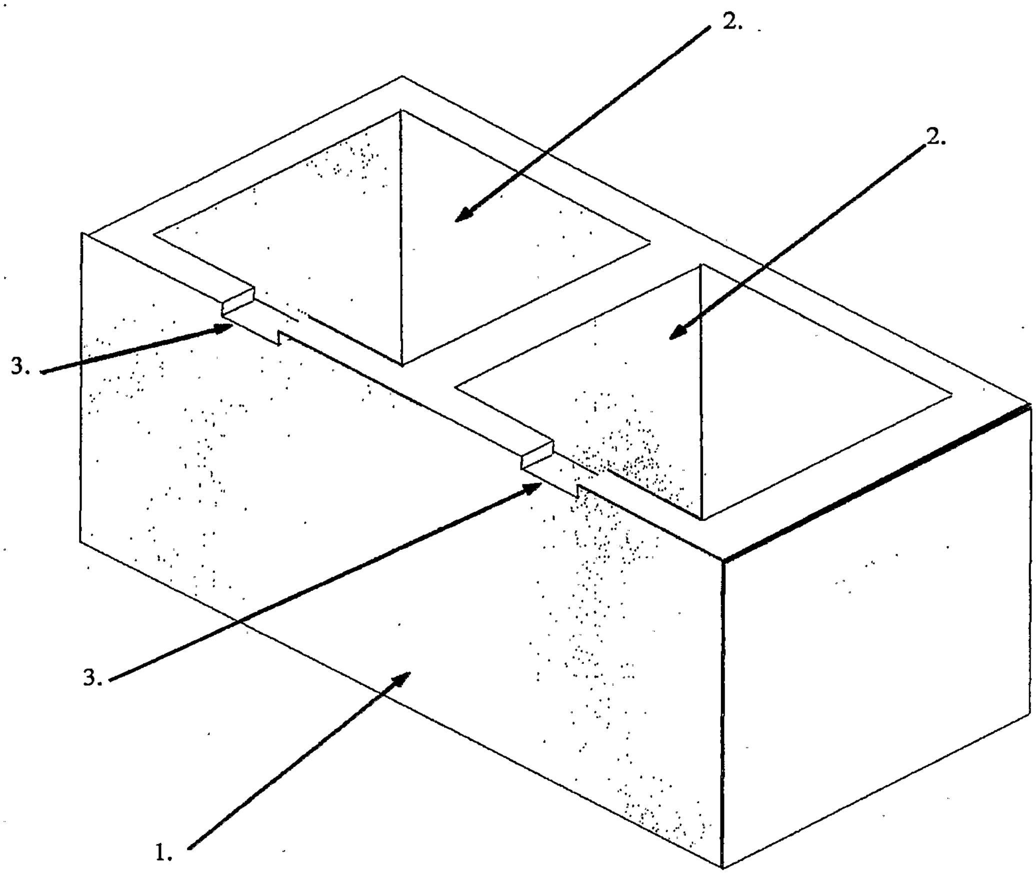

Figure 1

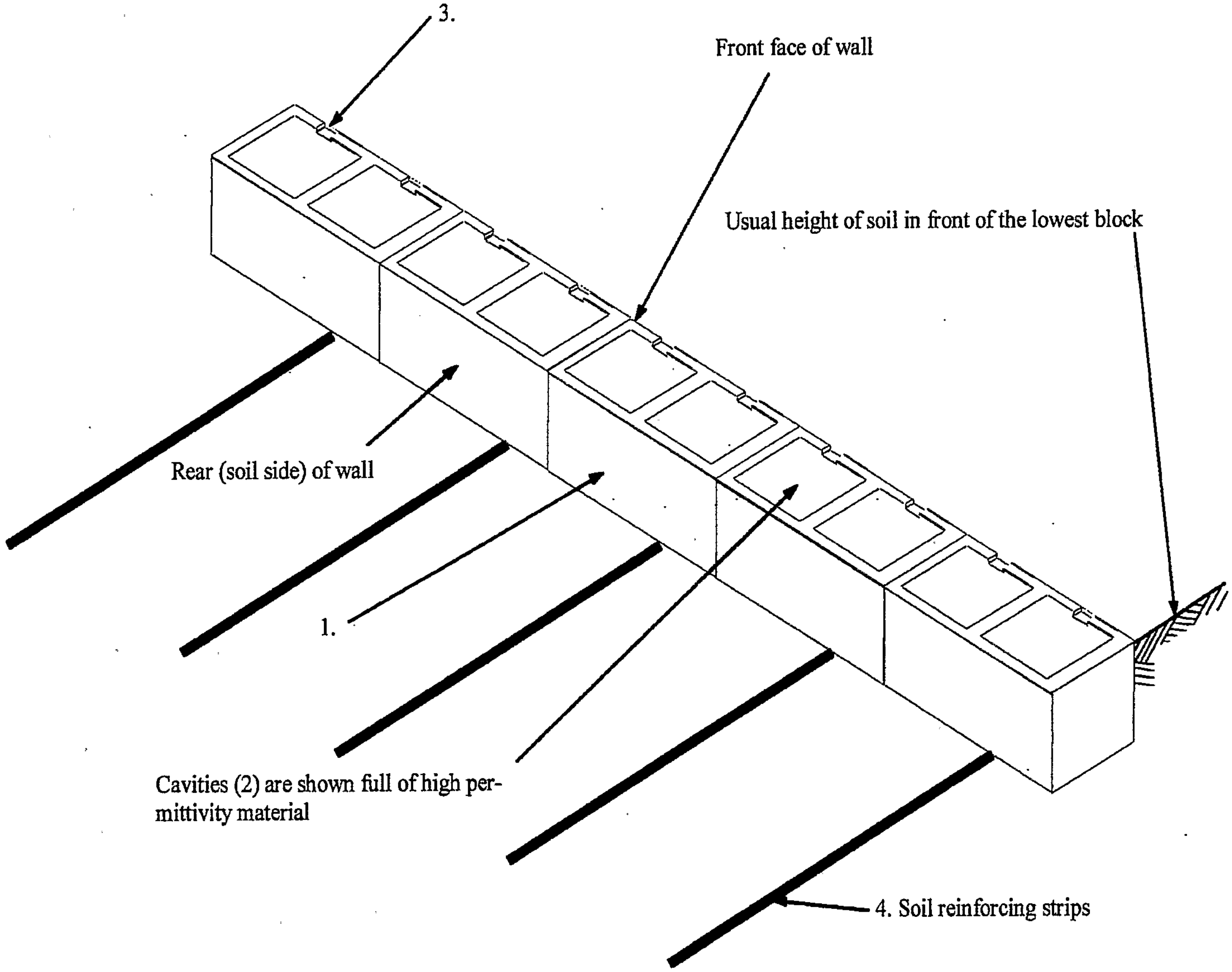

Figure 2—slots are positioned at the front of the wall

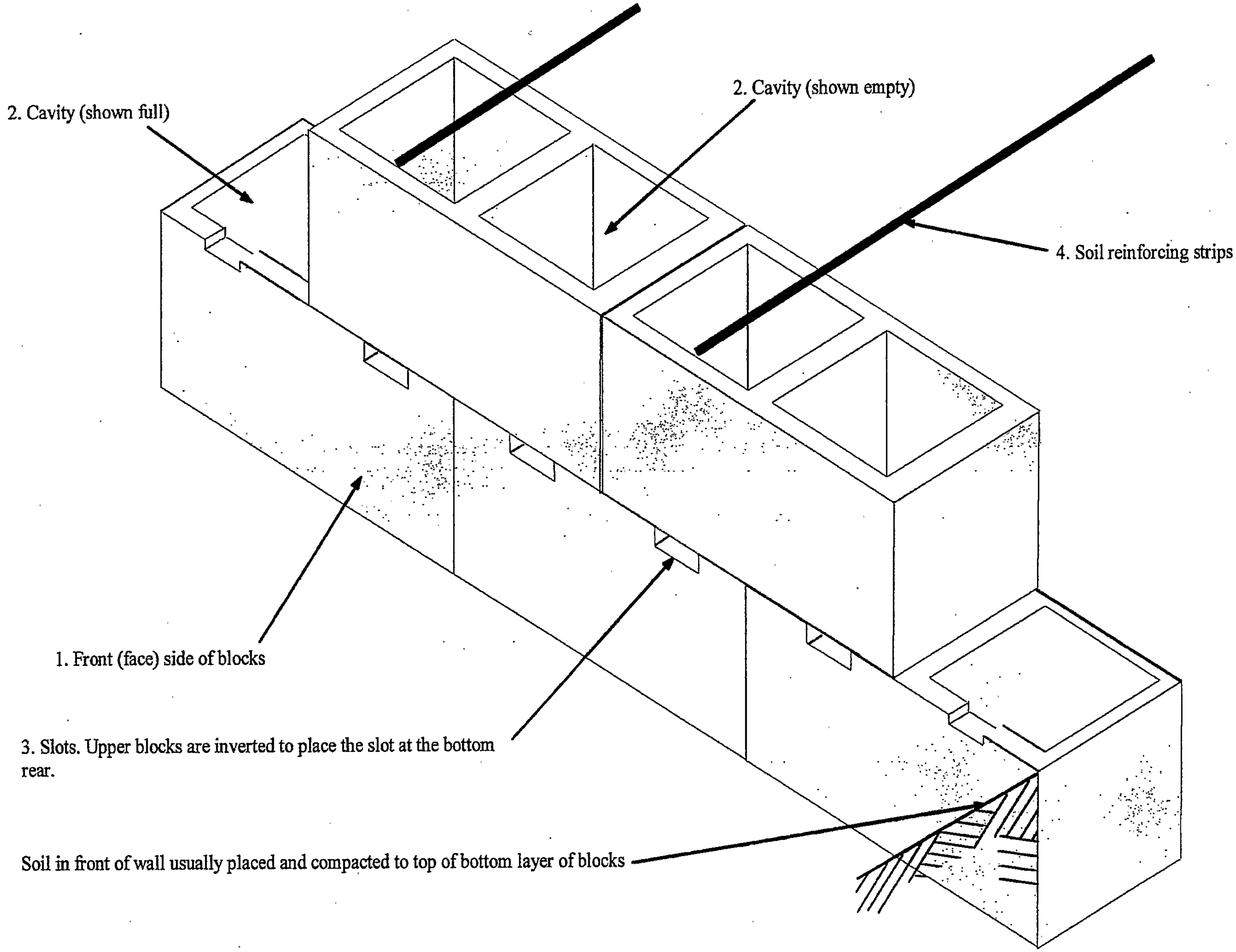

Figure 3 Installation of the second layer of blocks

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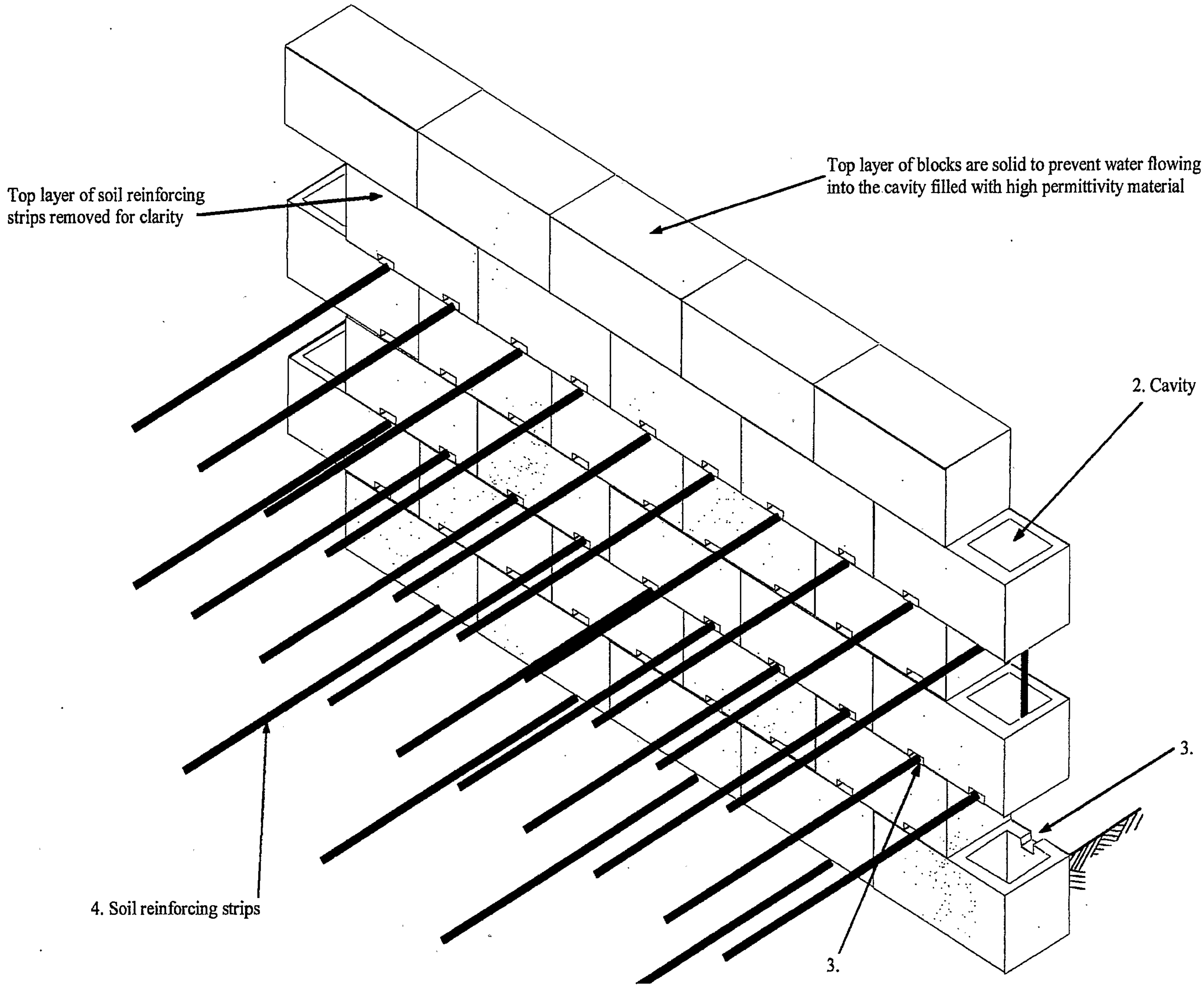

Figure 4. Assembled wall before backfilling.